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(54) Flexible strip with bail for suspending containers.

(57) The invention provides a self-adhesive flexible strip applicable to containers or bottles or the like, said strip having a bail which can be lifted away from the container to serve as a handle for suspending the container from a support hook or the like.

The strip is constructed of polymeric material of high mechanical strength and of very high ultimate elongation.

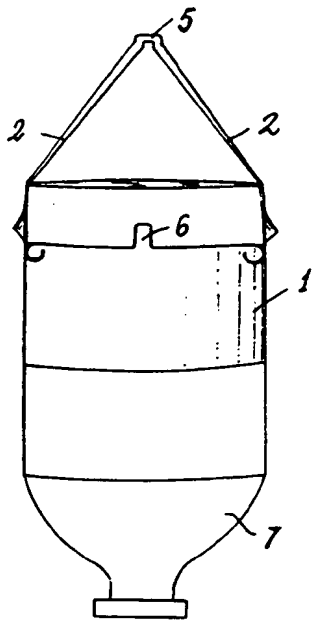

Fig. 4

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This invention relates to a flexible strip with bail for suspending containers, bottles or the like in particular bottles containing pharmaceutical products for drip-injection into a patient's vein.

The flexible strip is substantially in the form of a self-adhesive label applicable to the outer surface of a bottle, in proximity to its base or bottom. It comprises a cut which separates the main part of the label from a narrower portion acting as a handle for hooking the bottle to a support element. This handle (without adhesive or with the adhesive neutralized) remains attached and connected at its two ends to the main part of the label.

Many containers, in particular bottles containing substances to be injected into the patient's vein by drip, have to be suspended from a support with their mouth facing downwards for use.

For this purpose devices of various kinds are used, such as cages (generally of plastics construction), spirals etc., which have to be fitted to the bottle immediately before its use. The drawbacks of these systems are well known and will not be further described, being amply illustrated in DE-A-3631021, EP-A-386753, EP-B-99376 and in its corresponding US-A-4396128. The aforesaid patents all describe container and bottle hooking and support systems consisting of thin flexible plastics labels which are applied (via an adhesive previously spread over each label) to the outer surface of the bottle, in proximity to its bottom end.

Of the various devices proposed, those of most interest are described in EP-B-99376 and its equivalent US-A-4396128, and in EP-A-386753 which is very similar to EP-B-99376, to which reference will now be made.

EP-B-99376 describes a bail structure comprising an elongate-polymeric strip including a handle portion and two end anchor portions adapted to be adhered to opposite sides of a container.

During use, the bail structure is fixed, by an adhesive previously spread over it, to the outer surface in proximity to its bottom end. The handle portion is free of adhesive, or the adhesive which was applied to it is neutralized by various known methods. The handle portion can be moved from a storage position adjacent the bottom end of a container to a use position extending across the bottom end of the container, thus enabling the handle portion to be used to suspend the container.

The handle portion (which is formed from the polymeric strip material and is necessarily of very small transverse dimensions) has to be sufficiently strong to support the weight of the container to which it is applied, without danger of breaking.

Again, the thickness of the strip material cannot be too great otherwise it would lose the flexibility necessary to allow it to be easily and rapidly applied to containers by automatic machines operating at high speed.

In addition it should be noted that to pass from the storage position (in which the handle portion adheres to the lateral surface of the container) to the use position the handle portion has to be rotated about its two end anchor portions, by passing beyond the free edge of the container at its bottom end. In order for this to be possible, the material with which the handle portion is constructed must necessarily be somewhat stretchable, otherwise it could be impossible or very difficult to move it into its use position. There remains the basic fact that the handle portion must be sufficiently strong to support the load suspended from it without danger of breakage.

Consequently, according to the teachings of EP-B-99376 and US-A-4396128, the bail structure disclosed therein must be tough (see specification, all the examples and claims) and may be of solid, woven or nonwoven construction (see the disclosure of such patents).

The aforestated is confirmed by EP-A-386753 in which the handle portion is reinforced with a strip of fabric material.

The materials indicated as suitable in EP-B-99376 and US-A-4396128 are polyurethanes, polybutylene, polypropylenes and modified polyethylene ionomers.

A drawback deriving from a handle portion of very strong and substantially rigid structure is that it can be moved into the use position only with difficulty, so much so that a pull structure can be contemplated to facilitate moving the handle portion to its use position (see the final part of the description of the two patents, just before the claims). A further drawback derives from the fact that when in its storage position, the handle portion can be gripped only by inserting a fingernail between it and the container surface (to lift it and then grip it with the fingers, to be able to move it to its use position), with the result that often the handle portion breaks because the fingernail can damage it, so triggering its tearing.

An even more serious drawback deriving from the total or substantial rigidity of the handle portion is consequent on the fact that the container which it suspends from a support hook is in practice linked into a rigid system. As in many cases the container suspended from the described bail structure is a drip bottle in which the stopper which closes the bottle mouth is traversed by a needle connected by a tube to a needle inserted into the patient's vein, it follows that any knock against the bottle, against its support or against the connection tube between the two needles can easily break or damage the needle traversing the bottle stopper or withdraw it from the stopper.

The main object of the present invention is to provide a flexible strip with handle portion similar to those described in the aforesaid prior art, but in which the handle portion (in addition to being strong enough to support the weight of the bottle or container suspended from it without danger) can be easily and considerably elongated even as the result of a relatively small pull. In this manner, after the container has been suspended from a support hook by the handle portion, which has undergone only a part of its possible elongation, any knock or jolt against the container easily causes further elongation (without breakage) of the handle portion, with a consequent damping effect which prevents damage to the container and to the parts connected to it.

A further object is to provide a flexible strip with handle portion of the stated type which can be applied to any point of a container or bottle, even far from its bottom end, while still being able to very easily move the handle portion from the storage position to the use position.

A further object is to provide a flexible strip the handle portion of which can be easily gripped and lifted from the storage position by a finger without danger of damaging the handle portion during this operation.

These and further objects area attained by a flexible strip having a handle portion integral therewith, characterised in that said handle portion is of such dimensions and materials as to be easily stretchable and to allow the handle portion to be considerably elongated before it breaks, this breakage occurring under a load substantially greater than the weight of the container to which the flexible strip is applied.

Preferably the flexible strip with its handle portion is constructed of polyamide material, preferably polycaprolactam such as nylon 6.

Again preferably, for common bottles used for drip purposes, the flexible strip thickness is between 40 and 120 microns and the width of the handle portion is between 3 and 6 mm.

For a better understanding of the structure and characteristics of the flexible strip with handle portion according to the present invention, a preferred embodiment thereof is described hereinafter by way of non-limiting example with reference to the accompanying drawing in which:

Figure 1 is a front view of a flexible strip with handle portion applied to a paper tape support portion;

Figure 2 is a front view of the same flexible strip applied to the outer surface of a bottle in proximity to its bottom end;

Figure 3 is similar to Figure 2, but showing the operation of gripping the the handle portion with two fingers and stretching it to move it into its use position;

Figure 4 shows the inverted bottle, with the handle portion elongated and hanging from a hook.

The flexible strip shown on the drawings comprises a main part 1 and a handle portion 2 separated from the main part by a profiled cut 3, the handle portion 2 being connected at its two ends to the main part 1 by a strip portion in which there is no cut.

One surface of the main part 1 is printed with information relative to the product contained in the container to which it is applied, its opposite surface receiving a layer of self-adhesive glue (shown by a plurality of dots in Figure 1 only), which however is either not applied to the handle portion 2 or, if applied, is made inactive by applying to it a layer of printing ink or varnish in known manner.

It is important to note that the glue is also not present or is made inactive on those portions of the strip extending from both ends of the handle portion 2. This is to prevent the pull exerted by the handle portion on the main part 1 of the flexible strip (when the bottle to which the flexible strip is applied is suspended from a hook by its handle portion) from triggering rolling or lifting of the flexible strip, which could hence become detached from the bottle.

A continuous succession of flexible strips of the described type is applied to a continuous siliconed paper tape 4, one portion of which is shown in Figure 1, and from which the flexible strips can be easily removed in conventional manner.

From the drawings it can be seen that at the centre of the handle portion 2 there outwardly extends an appendix 5 at which the cut 3 is correspondingly shaped, defining a glue-free tab 6.

The described flexible strip is applied (in known manner by conventional automatic machines) to the outer surface of a drip bottle 7, in proximity to ifs bottom end. The handle portion 2 and its appendix 5 are positioned at the bottom end of the bottle 7 as shown in Figure 2.

When the bottle is to be used for drip purposes, a fingernail is inserted below the appendix 5 of the handle portion, to easily lift it from the bottle surface and enable it to be easily gripped by two fingers and pulled until it has stretched (Figure 3) sufficiently to enable the handle portion to be rotated into its use position (Figure 4) in which it can be easily hooked on a hook or door handle or any other support, even of relatively large irregular size.

As already stated, it is essential that the handle portion 2 is able to resist the load which it is required to support, and that it can be easily and considerably elongated, including in several stages. This enables the handle portion to be easily moved

from the storage position (Figure 2) to the use position (Figure 3), to be easily hung on any support and to undergo subsequent further elongation if a violent impact is transmitted to the bottle 7, for example if the bottle is allowed to fall violently onto its support hook. This subsequent elongation of the handle portion acts as a damper and reduces or eliminates damage which the bottle or the parts connected to it could undergo.

Materials which have been found particularly suitable for constructing the flexible strip are polyamide materials, such as polycaprolactam or nylon 6. This material (with a density of 1.13) has a very high ultimate tensile stress (≧ 60 N/mm^2), a considerable ultimate elongation (exceeding 300%) and high dimensional stability with varying temperature (less than 1.5 for a temperature variation from 150 °C to 30 °C).

With this material flexible strips of the described type can be constructed able to support bottles of up to 250 g total weight for a thickness of 80 microns and a handle portion of only 3 mm width. This handle portion has a yield strength (ie at which it begins to stretch) which is very low (only 1.7 kg) whereas its ultimate tensile stress is as much as 4.9 kg (the elongation being 300% as already stated).

To suspend a bottle weighing up to 1.2 kg the flexible strip can have a thickness of 100 microns and the handle portion a width of only 5 mm, in which case the yield strength is 4.2 kg and the ultimate tensile stress is 7.3 kg (the ultimate elongation again being about 300%).

Finally, the exceptional elongation and strength of the handle portion enables the flexible strip to be also applied to containers of elaborate shape and also in a position far from their bottom end, which is not possible with analogous known flexible strips.

Claims

1. A flexible strip with handle portion for suspending containers, bottles and the like, characterised in, that the handle portion is easily stretchable to allow considerable elongation before its breakage, this breakage occurring under a load substantially greater than the load applied by the container which the flexible strip is intended to support.

2. A flexible strip as claimed in claim 1, characterised by being constructed of polyamide material.

3. A flexible strip as claimed in claim 2, characterised in that said polyamide material is polycaprolactam or nylon 6.

4. A flexible strip as claimed in claims 1 to 3, characterised by having a thickness of between 40 and 120 microns and a handle portion of width between 3 and 6 mm.

5. A container provided with a flexible strip in accordance with claims 1 to 4.

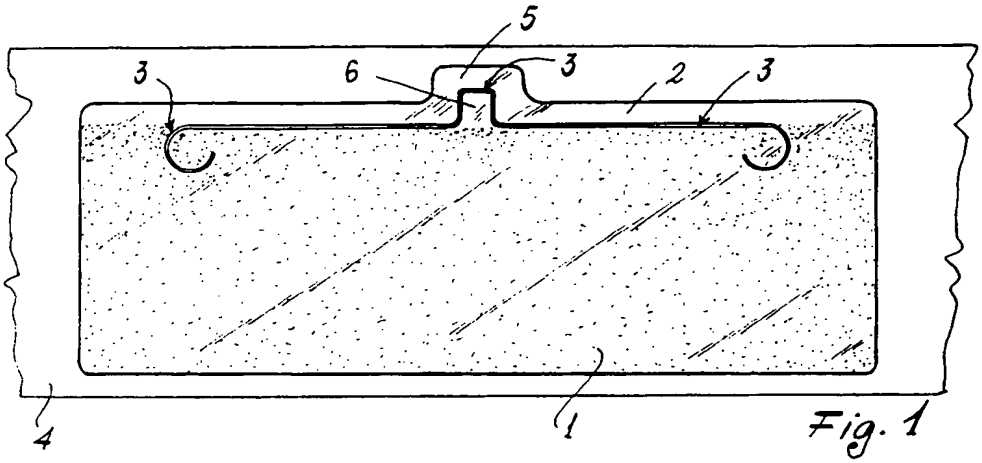

Fig. 1

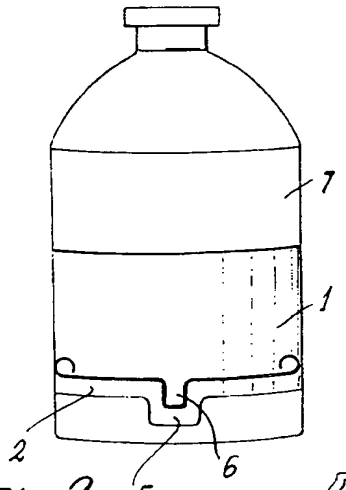

Fig. 2

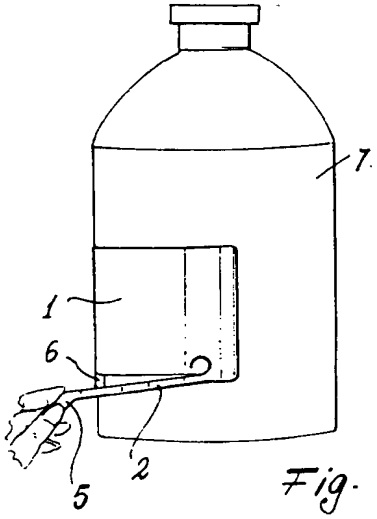

Fig. 3

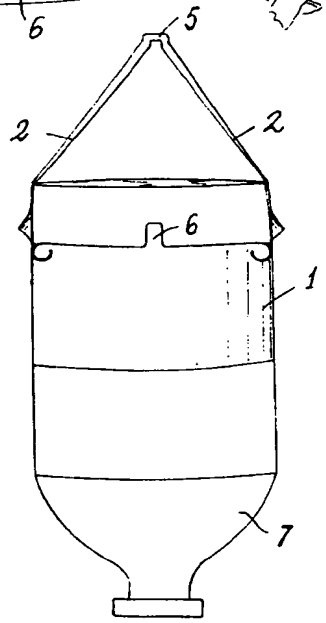

Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 94 10 8292

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
X,D	EP-A-0 386 753 (HERBERT) * column 3, line 52 - column 4, line 33; figures *	1,2	A61M5/14 G09F3/02
P,X	DE-U-93 10 045 (FRESENIUS AG) * page 7, paragraph 5; figures *	1,2	
X	WO-A-92 15081 (TAPECON INC) * page 8, paragraph 4 - page 9, paragraph 1; figures *	1	
A	DE-A-37 41 865 (RITTER) * the whole document *	1-5	

TECHNICAL FIELDS SEARCHED (Int.Cl.5)

A61M
G09F
B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	15 September 1994	Clarkson, P

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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